

## **DETAILED ACTION**

### ***Minor Informalities***

1. The disclosure is objected to because of the following informalities:

The abstract of the disclosure is objected to because it has more than 150 words. Abstract should be between 50 and 150 words.

In the Abstract, the term "said" should be --deleted --. It is noted that the term "said" has been used extensively within the abstract. Applicant is required to delete all of them and check for accuracy.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the fourth paragraph of 35 U.S.C. 112:

Claims rejected under 35 U.S.C. 112, fourth paragraph. The test for a proper dependent claim is whether the dependent claim includes every limitation of the parent claim. The test is not whether the claims differ in scope. A proper dependent claim shall not conceivably be infringed by anything which would not also infringe the basic claim.

A dependent claim does not lack compliance with 35 U.S.C. 112, fourth paragraph, simply because there is a question as to (1) the significance of the further limitation added by the dependent claim, or (2) whether the further limitation in fact changes the scope of the dependent claim from that of the claim from which it depends. The test for a proper dependent claim under the fourth paragraph of 35 U.S.C. 112 is whether the dependent claim includes every limitation of the claim from which it depends. The test is not one of whether the claims differ in scope. See MPEP § 608.01(n), "Infringement Test" for dependent claims.

2. Claims 27, 29, 32, 42-43 and 47, are rejected as failing to define the invention in the manner required by 35 U.S.C. 112, fourth paragraph.

Claims 27, 29, 32, 42-43 and 47, are improper dependent claims; because they do not include all the limitations of base claim 1.

For example claim 27 recites the limitation:

“measuring a time of flight ( $t_1$ ) of a forward signal, transmitted from the first transducer in a forward direction, being generally in the direction of flow along the flow path to the second transducer, **the time of flight( $t_1$ ) being measured using a method as claimed in claim 1**”.

But claim 1 recites “**determining a time of flight of the second ultrasonic signal ...**”.

The Examiner considers that; claim 27 does not include all the limitations of claim 1 because claim one does not measure time of flight ( $t_1$ ), nor measures time of flight ( $t_2$ ), such as specific times.

The Examiner considers that; if claim 1, determines a time of flight of the second ultrasonic signal, how is going to measure the time of flight ( $t_1$ ) for the first forward signal; or time of flight ( $t_1$ ) is equal or not to the time of flight ( $t_2$ ).

The Examiner also considers that; these two limitations from these two claims in combination change the scope of the parent claim 1, and dependent claim becomes ambiguous and indefinite.

### ***Allowable Subject Matter***

3. **Claims 1-4, 6-10, 12-17, 20-26, 28, 34-39 and 41** are allowed.

4. The following is an examiner's statement of reasons for allowance:

**Claims 1-4, 6-10, 12-13, 21-26, 28, 34-39 and 41**, are allowable because the closest prior art, Schoenfelder et al. [European Patent Application EP 1 006 500 A2 2/12/1999] (hereafter Schoenfelder) and Walters et al. [U.S. Patent No.

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5,388,445] (hereafter Walters), either singularly or in combination, fail to anticipate or render obvious a method (or apparatus, or an aspirated smoke detector) of determining a time of flight of a signal transmitted between a transmitter and a receiver, said method comprising:

determining a time of reception of the introduced phase shift in the second ultrasonic signal by comparing the waveform of the first received signal to the waveform of the second ultrasonic signals and determining a point of diversion between corresponding characteristic waveform features of the first and second received signals comprising super positioned said first and second received signals; nor

determining a time of flight of the second ultrasonic signal based on the determined time of reception of the introduced phase shift and its time of generation; in combination with all other limitations in the claim(s) as claimed and defined by applicant.

**Claims 14-17 and 20** are allowable because the closest prior art, Schoenfelder Walters, either singularly or in combination, fail to anticipate or render obvious a method (or apparatus) of determining a time of flight of a signal transmitted between a transmitter and a receiver, said method comprising:

generating at a transducer of the transmitter a first and second ultrasonic signal, where both signals comprise plurality of cycles of a characteristic waveform feature, and the second ultrasonic signal further comprises a waveform modification introduced at a predetermined point in time of the duration

of the second ultrasonic signal, and said waveform modification comprises a phase shift in a cycle of the characteristic waveform feature; nor scanning through said the first received signal and the second received signal in time to determine a point of diversion between the characteristic waveform features of the first received signal and the corresponding characteristic waveform feature of the second received signals, wherein said point of diversion corresponds to a time of reception of the introduced waveform modification at the receiver; in combination with all other limitations in the claim(s) as claimed and defined by applicant.

***Response to Arguments***

5. Applicant's arguments with respect to the claims have been fully considered but they are moot in view of the new ground(s) of rejection set forth hereinbefore.

***Action Is Final, Necessitated by Amendment***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory

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period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Felix Suarez, whose telephone number is (571) 272-2223. The examiner can normally be reached on weekdays from 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eliseo Ramos-Feliciano can be reached on (571) 272-7925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300 for regular communications and for After Final communications.

October 21, 2011

/Felix E Suarez/  
Examiner, Art Unit 2857

/MICHAEL NGHIEM/

Primary Examiner, Art Unit 2857